

EM-RFO--EGGR-771OPS-1994-0062 FINAL

771 Operations  
(Name of Facility)

Plutonium Processing and Handling  
(Facility Function)

Rocky Flats Plant EG&G Rocky Flats  
(Site) (Contractor)

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**Name:** S. G. Mathiasmeier **Date:** 08/04/1995  
(Authorized Classifier (AC))

**1. Occurrence Report Number:** EM-RFO--EGGR-771OPS-1994-0062

#1490/1505/1554/1600:A Pu-containing liquid was drained from a processline. Line draining was not within the scope of procedure being used.

**2. Report Type and Date:** FINAL

**Date Time**

**Notification:** 10/08/1994 10:13 (MTZ)

**Initial Update:** 10/25/1994 16:19 (MTZ)

**Latest Update:** 07/10/1995 12:47 (MTZ)

**Final:** 08/18/1995 09:04 (MTZ)

**3. Occurrence Category:** Unusual

**4. Number of Occurrences:** 1 **Original OR:**

**5. Division or Project:** EG&G Rocky Flats Plant

**6. Secretarial Office:** EM - Environmental Management

**7. System, Bldg., or Equipment:** Building 771, Solution Stabilization Operation

**8. UCNI?:** No

**9. Plant Area:** Waste Stabilization

**10. Date and Time Discovered:** 10/06/1994 19:37 (MTZ)

**11. Date and Time Categorized:** 10/06/1994 20:44 (MTZ)

**12. DOE HQ OC Notification:**

<b>Date</b>	<b>Time</b>	<b>Person Notified</b>	<b>Organization</b>
10/07/1994	21:54 (MTZ)	K. Juroff	DOE/HQ

**13. Other Notifications:**

<b>Date</b>	<b>Time</b>	<b>Person Notified</b>	<b>Organization</b>
10/06/1994	20:50 (MTZ)	SDO, J. Conti	DOE/RFFO
10/07/1994	21:03 (MTZ)	D. Vaughn	DOE/RFFO
10/07/1994	21:32 (MTZ)	E. Kray	STATE

**14. Subject or Title of Occurrence:**

#1490/1505/1554/1600:A Pu-containing liquid was drained from a processline. Line draining was not within the scope of procedure being used.

**15. Nature of Occurrence:**

- 01) Facility Condition
- F. Violation/Inadequate Procedures
  - 01) Facility Condition
- A. Nuclear Criticality Safety
  - 02) Environmental
- E. Environmental Agreement/Compliance Activities

**16. Description of Occurrence:**

At 0025 hours on Tuesday, September 27, 1994, a pre-evolution briefing was held in Building 771, in accordance with the requirements in Conduct of Operations (COOP) procedure 1- 31000-COOP-011, Pre-Evolution Briefing. The pre-evolution briefing was held prior to the performance of Task Information Package (TIP) 771-OPS-94-005, Transfer Solution from D-467 to Glovebox 42. All personnel involved in the performance of this TIP were in attendance at the briefing. TIP 771-OPS-94- 005 provided instructions for air sparging and vacuum transfer of the actinide solution in Tank D-467, Room 149, into 4-liter narrow-mouth bottles. As required by the TIP, these bottles were to be filled to no more than approximately 3.75 liters, and were to be placed in a one-layer planar array inside Glovebox 42, Room 149. At 0320 hours, September 27, 1994, an entry in the Shift Managers' (SMs') Logbook indicated that the performance of the initial portion of the TIP was completed in a commendable manner, and that the

samples had been drawn from the first three bottles of solution as required by the TIP.

Step 7.5.3 of the TIP is a Hold Point, and reads as follows, "Verify that operations may continue after the first three narrow mouth bottles have been analyzed and meet the requirements of NMSLs (referenced Appendix 5)." The Production Foreman (PF) signed off on this step on September 28, 1994. An entry in the SMs' Logbook on September 28, 1994, at 0100 hours, states that the continued performance of the TIP would not take place on this date because of the termination of operations caused by the Lockout/Tagout (LO/TO) of Fans FN-1 and FN-3. This caused the continuation of the solution transfer operations to be postponed until the following day.

At 0018 hours on Thursday, September 29, 1994, a pre-evolution briefing was held prior to the continuation of TIP 771-OPS-94- 005 tank draining activities. The Production Manager acted as SM for this briefing, as the SM was involved in a regularly scheduled shift briefing for midnight shift personnel. All personnel involved in the performance of the TIP were in attendance at the pre-evolution briefing, as all had attended the shift briefing on the preceding day shift. The Process Specialists (PSs) involved in the performance of the TIP had worked the day shift on September 28, 1994, and had returned to the plantsite to work the midnight shift in the morning hours of September 29, 1994. An entry in the SMs' Logbook at 0400 hours on September 29, 1994, states that the SM had observed the performance of the TIP activities, and that the operation had gone well. The entry further stated, "One hour final pull on Tank 467 now in process." There were no further entries in the logbook on this date regarding the performance of the TIP.

There were no pertinent logbook entries until October 6, 1994; however, a letter written by the PM on October 7, 1994, supplied further information on the actions that followed the performance of TIP 771-OPS-94-005 on September 29, 1994. A portion of the PM's letter read as follows:

"Tank 467 draining was completed on September 29, 1994 on the Mid Shift. After the last of the Tank 467 solution was collected, the decision was made to verify that additional drain lines connected to the identified lines were free from liquid. This decision was based on a safety factor to reduce the risk of leakage from these lines and elimination of personnel exposure to clean-up and contain a possible leak.

The drain line from Tank 467 is connected to the fill line of Tank 467 and the drain line of Tank 973. Tank 973 is a recycle tank used to collect the same type of solution as that in Tank 467.

After the initial draining of Tank 467 was complete, the drain valve was closed and the fill line valve was opened to assure that all solution was removed. The

solution from this line was collected in a 4-liter bottle. The drain line valves to Tank 973 were then opened to verify that this line was empty. This solution was also placed into 4-liter bottles. A total of approximately 5 liters of solution was collected during this operation."

Because the actinide solution from the drain lines was appreciably darker than that from Tank 467, on Wednesday, October 5, 1994, the PM decided to pull a sample of solution from one of the bottles containing the darker colored solution. This sampling was not authorized by the TIP. Chemical Laboratory personnel performed an unofficial analysis of this sample, but no standards were run with this analysis. The sampling results were 8.52 and 8.58 grams/liter concentration of plutonium in this solution. The PM was aware that these readings were outside the Nuclear Material Safety Limits (NMSL) of 5 grams/liter for Glovebox 42. The limits in NMSL 940037/MFS-002-0/2/C6-13B, Tank D-467 Solution Transfer to Glovebox 42 (For Use with TIP-771-OPS-94-005, Rev. 0 Only), were formulated specifically for use with the TIP Tank 467 draining operations. Additionally, NMSL 940037/MFS-02-0/2/6C-13I, Line 5 Glovebox H-4 Nash Vacuum Pump System Operation for Tank D-467 Solution Transfer to Glovebox 42 (For Use with TIP-OPS-94-005, Rev. 0 Only), states, "NO other operations permitted."

At 1937 hours on October 6, 1994, the PM informed the Building 771 SM that operations had been performed on September 29, 1994, which were outside the scope of TIP 771-OPS-94-005. The PM notified the SM that the NMSL for Glovebox 42 had apparently been violated. The SM immediately notified the Building 771 Operations Manager (OM), and reported the occurrence to the Notification Center. The SM terminated Building 771 operations at 2043 hours, and initiated the preparation of Termination Operations Order 00-771-77. The SM notified the Department of Energy (DOE) Facility Representative, and briefed the DOE Staff Duty Officer (SDO). The SM attempted to notify the Building 771 Criticality Safety Building Support (CSBS) Engineer. Failing to find the CSBS, the SM was able to locate other Nuclear Safety Criticality Engineering personnel who agreed to come to plantsite to investigate the incident. Subsequently, the SM presented a briefing to the midnight shift personnel at 0021 hours on October 7, 1994, to inform them of the termination of operations.

At 0108 hours on October 7, 1994, Nuclear Safety Engineering personnel notified the SM that their investigation had revealed that no imminent danger existed in Building 771 because of this incident. However, the Nuclear Safety Engineer indicated to the SM that a possibility existed that double contingency had been violated because of this incident. A critique was held on this occurrence at 0730 hours, October 7, 1994.

On October 10, 1994, during an independent review and verification of the valve Lockout/Tagout (LO/TO) for TIP 771-OPS-94-005, a PS determined that an air operated valve on the line leading to Tank 467 was incorrectly locked and tagged out. In addition, there was no LO/TO on the valve which should have been locked

and tagged out. This incident was reported under SPMS #1505, which was combined with the original report.

On October 18, 1994, it was determined that unauthorized changes had been made to Appendix 7, Initial Valve Lineup, of TIP 771-OPS-94-005. In the Appendix 7 section labeled Deficiencies, hand-written notations were made that some valve numbers and locations in this Appendix were incorrect. The entry further stated that the correct numbers and locations of the valves were inserted on pages 5 and 6 of the Appendix; this entry was signed by the PM. The pen-and-ink changes were made and were initialed by the PM. Because this occurrence, reported as SPMS #1554, was discovered during the investigation of the original report, this occurrence was also combined with the original report.

At 1340 hours on October 26, 1994, following a further inquiry into the draining and sampling activities in Glovebox 42, it was determined that an OSR violation had occurred on October 6, 1994. When samples were taken from the 4-liter bottles and analyzed, the compensatory measures delineated in Addendum 1 to Termination Shift Order 771-94-075, Attachment 12, were not followed as required. The specific Steps which were not followed were as follows:

"2. The Building 771 Operations Manager will give specific daily permission to perform analyses on TIP 5 samples, Building 559 waste samples, and Building 771 Utilities samples.

3. Laboratory personnel will report to the Shift Manager/designee and provide a status of sampling activities every four hours."

These requirements were not met during the sampling and analysis on October 6, 1994. While the compensatory action requirements were administrative in nature, not meeting these requirements violated an established corrective action covering a Limiting Conditions for Operations (LCO) requirement. However, the technical basis for the compensatory measures was not violated. On October 26, 1994, SPMS 1600 was added to this occurrence report as it was considered to be part of the original occurrence. On this date, it was determined that an additional issue existed which would be considered part of the original occurrence reported in SPMS 1490. It was determined that an Operational Safety Requirement (OSR) violation had occurred because liquid samples were removed from Glovebox 42, Room 149, and were subsequently analyzed without the permission of the Building 771 Operations Manager. This issue was reported under SPMS 1600 on October 26, 1994, and this occurrence was combined with the original report.

Due to the fact that occurrences, SPMS Numbers 1505 and 1554, were discovered during the investigation into occurrence SPMS 1490, these three incidents were combined in this report. All three occurrences pertain to the

unauthorized draining of the fill lines of Tank 467 and the drain line of Tank 973 in Building 771.

**17. Operating Conditions of Facility at Time of Occurrence:**

Normal Curtailed Operations

**18. Activity Category:**

03 - Normal Operations (other than Activities specifically listed in this Category)

**19. Immediate Actions Taken and Results:**

The movement, transfer, and operations involving fissile material in Building 771 were terminated. Following the critique for this occurrence, Standing Order 34 was written, including the entire Rocky Flats plantsite in this termination of operations.

Glovebox 42 was posted as an NMSL Violation as required by the Building 771 NMSL Manual.

Access to Room 149, which contains Glovebox 42, was limited to allow essential operations only, under the direction of the Building 771 OM.

**20. Direct Cause:**

- 3) Personnel Error
- B. Procedure Not Used or Used Incorrectly

**21. Contributing Cause(s):**

- 5) Training Deficiency
- D. Insufficient Refresher Training

- 6) Management Problem
- A. Inadequate Administrative Control

- 6) Management Problem
- C. Inadequate Supervision

**22. Root Cause:**

- 6) Management Problem
- E. Policy Not Adequately Defined, Disseminated, or Enforced

### **23. Description of Cause:**

The direct derivation method was used to determine the direct cause of these occurrences. The root and contributing causes were determined by an assessment team from the Performance Assurance (PA) Division of EG&G Rocky Flats Plant. All interviews and data gathering activities were performed by the PA personnel, and no Occurrence Notification and Reporting (ON&R) personnel were part of the investigatory team. The causes have been supplied for this report by the PA team as a result of their independent investigation. The analysis written by the PA team was adapted to the ORPS reporting system by Occurrence Reporting personnel. The PA inquiries resulted in the report titled, "Root Cause Analysis and Generic Implications of the Unauthorized Draining of a Process Line in Building 771", as distributed under cover of letter number WSG-317-94. The portions of this section enclosed in quotes were quoted from the above referenced report.

#### **ROOT CAUSE OF THE OCCURRENCE:**

The root cause of this occurrence was attributed to a Management Problem, Policy not Adequately Defined, Disseminated, or Enforced. The following five paragraphs are quoted from the PA investigatory team report:

"The perception of the inconsistent application of discipline at Rocky Flats is so strong that some personnel may be afraid to stop and report unauthorized or unsafe activities.

During interviews, the PM stated that one of the reasons he didn't stop the unauthorized operations was because he felt that he had lost his job already.

Interviews conducted with other workers at Rocky Flats indicated that some would stop unauthorized operations while others would not, but that both groups expected to be disciplined and criticized for reporting the noncompliance.

Evidence of consistent implementation of rewards and sanctions could not be obtained. Individuals interviewed spoke of inconsistent application of discipline, but could not provide specific supporting facts.

Where fear of reprisal exists for reporting safety problems, these unreported safety problems (whether valid or not) will likely remain unknown to management, therefore, precluding taking effective corrective actions."

The PA investigatory team further discussed the root cause as follows:

"The removal of the LO/TO as required in TIP 5 did not comply with the compensatory measures established for USQD- RFP-93.1503-GLS, Raschig Ring Tanks Non-Compliance with NMSLs/CSOLs.

USQD-RFP-93.1503-GLS requires compensatory actions to establish controls that ensure no physical movement of solution occurs through gravity feed and by mechanical transfer means. The recommended compensatory measures include the use of physical restraints to prevent all possible methods of solution transfer (e.g., gravity feed, mechanical, etc.). Examples given include separating and blanking off all lines into and out of vessels which could transfer solution a verified LO/TO of all vacuum/vent valves to the vent position, and the LO/TO of the valves and pumps required for solution transfer, where solution transfer could only occur through active mechanical means.

Letter BDL-019-94 from the Building 771 Assistant Operations Manager to the Raschig Ring Action Plan Program Manager states that compensatory measures taken were to electrically LO/TO the vacuum pumps and the vacuum header root isolation valve.

The LO/TO of the vacuum pump consists of closing valve HV-1331 and placing the Line 5 Nash Pump Local Disconnect to the OFF position. The LO/TO was removed when the Line 5 Nash Pump Local Disconnect was placed in the ON position on September 26, 1994, at 1034 and Valve HV-1331 was opened on September 27, 1994, at 0120. The LO/TO was not replaced until completion of the tank draining evolution on September 29, 1994, at 1025. The TIP 5 end-of-shift instructions did not require that the LO/TO be replaced at the completion of activities each day. The controls to ensure that the vacuum pump was not operated except during the scheduled tank draining were less than adequate in that there were no physical barriers in place to preclude activities outside the scope of the TIP. Interviews indicated that not replacing a LO/TO until completion of the activity, even if the activity lasted several days, was normal for Building 771. During the actual performance of the TIP 5 activities the removal of the LO/TO was acceptable as adequate controls were in place."

#### FIRST CONTRIBUTING CAUSE OF THE OCCURRENCE:

The first contributing cause of this occurrence was attributed to a Management Problem, Inadequate Supervision. The following eight paragraphs are quoted from the PA investigatory team report:

"Supervision was LTA to prevent one person from deliberately undertaking an unauthorized operation. The PM, PF, and STA left the area prior to the end of the TIP 5 operation. Additionally, the SM entered the area of Glovebox 42 during the unauthorized operation and took no action when he saw the dark solution in Glovebox 42.

At the completion of the draining of Tank D467, all supervision left the area for lunch and the PS was alone at Glovebox 42. Neither the PM nor PF, who had supervisory responsibilities, stayed in the area until TIP 5 was completed. They

both left prior to the completion of the one hour vacuum pull and the re-establishment of the vacuum pump LO/TO.

Although not required by TIP 5, an STA was verbally assigned by his management to observe the TIP 5 evolution. The STA also left prior to the completion of the one hour vacuum pull and the re-establishment of the vacuum pump LO/TO.

At the time that the SM entered the area, a dark solution was in the flask in Glovebox 42. He noted the solution was a darker color and commented on the color to the PM when the PM returned to the area. The SM then left the area without any further investigation into the activities.

TIP 5 required the presence of the Operations Manager or designee in the process area during the performance of activities involving the movement of SNM. After completion of the Tank D467 draining and prior to the vacuum pull to remove any residual solution in the drain line and tank, the PM left the area, even though SNM could have been transferred during the vacuum pull. Also, the vacuum pull was included in the solution transfer portion of TIP 5.

TIP 5 required that the Operations Manager or a designee appointed in writing observe the operation. The PM was not appointed in writing to act for the Operations Manager. However, on the two previous tank draining operations, the PM was designated in writing to act for the Operations Manager in observing operations during the movement of SNM.

Through interviews, it was discovered that the PS assigned to perform TIP 5 was previously known by management as not completely supportive of COOP. It was known that he did not think COOP controls were necessary in order to drain the tanks and associated lines. He also was known to have a lack of respect for authority. These factors were apparently not considered in leaving the PS alone during the vacuum pull.

Due to expired training, the PS, PM, and STA assigned to observe the TIP 5 operation were not qualified to participate in the TIP 5 operation. This condition was not recognized by management prior to the performance of TIP 5."

#### SECOND CONTRIBUTING CAUSE OF THE OCCURRENCE:

A second contributing cause was attributed to a Management Problem, Inadequate Administrative Control. The following four paragraphs are quoted from the PA investigatory team report:

"Corrective actions were not yet implemented or were LTA for previously identified events or circumstances with characteristics similar to the causal factors of this event.

Previous reviews, assessments, and memoranda provided management with opportunities to implement effective corrective actions to preclude this type of event. The following examples are not intended to be all inclusive.

An informal memo from the Manager, Criticality Analysis Engineering to the Director, Nuclear Safety Engineering, dated March 8, 1993, discussed many concerns relating to criticality safety. The broad concerns discussed in the memo were immature conduct of operations, reliance on procedure compliance in a system not yet ready to ensure procedural compliance, and inadequate independent oversight of operations within EG&G.

A collective significance evaluation of criticality safety procedural infractions at RFETS was conducted in the second quarter of 1994. This report was issued to the Associate General Manager, Standards, Audits, and Assurance on May 16, 1994 with a copy to the Chairman of the Nuclear Criticality Safety Committee. This evaluation identified LTA implementation of policies; LTA accountability of management/personnel; task performance errors; and ineffective corrective actions to identified deficiencies."

#### THIRD CONTRIBUTING CAUSE OF THE OCCURRENCE:

A third contributing cause was attributed to a Training Problem, Insufficient Refresher Training. The following three paragraphs are quoted from the PA investigatory team report:

"The process to ensure that individuals meet the current training and qualification requirements prior to assignment of work activities in Building 771 is LTA in that several individuals involved in the TIP 5 operation had expired training and qualifications. Due to expired training and qualification, the PS and PM were not qualified to participate in the TIP 5 operation. Also, the STA's nuclear criticality safety training had expired.

The PM's Nuclear Criticality Supervisor training expired on 09/10/94. The PS's Glovebox training expired on 02/04/94. The STA's Nuclear Criticality Safety training expired on 07/14/94. The SM's RCRA CST and RCRA OJT training expired on 03/03/94. Additionally, some of the other individuals signed into the area had expired RCRA OJT, Hazardous Waste, Radiation Worker, Glovebox, Nuclear Material Safeguards, and Hazardous Communication training.

The annual Nuclear Criticality Safety Committee appraisal of Building 771 operations, conducted on June 24, 1993, identified 30 individuals who did not have current nuclear criticality training. The appraisal report recommended the development of a program to ensure that worker training requirements are monitored to prevent deficiencies before they occur. The corrective action to address this concern was either not implemented or ineffective."

#### FOURTH CONTRIBUTING CAUSE OF THE OCCURRENCE:

A fourth contributing cause was attributed to Barriers, LTA, and this was listed in the PA report as being ORPS cause code 4A. ORPS cause code 4A is a Design Problem, Inadequate Man- machine Interface, and Occurrence Reporting personnel were unable to determine the source of the PA team's categorization information. However, this categorization is inaccurate as it relates to the ORPS system. The following two paragraphs are quoted from the PA investigatory team report:

"In order to provide adequate protection for individuals, the facility, or the environment from harm, barriers and controls are placed between the hazard and the potential target. The concept of establishing barriers and controls is sometimes called defense-in-depth. Defense-in- depth can consist of physical and administrative barriers and controls as well as process knowledge and supervisory oversight. In the development of TIP 5, physical barriers were not specified. Instead, administrative barriers in the form of a procedure (TIP 5), the process knowledge of the operators, and supervisory oversight by the PM and PF were relied upon.

The decision not to use physical barriers (e.g., LO/TO) was made, according to interviews, because it was assumed by those who developed TIP 5 and the supporting Criticality Safety Evaluation that personnel executing TIP 5 would do so in accordance with COOP concepts. Since no physical barriers were used and supervisory oversight was absent during the unauthorized operation, defense-in-depth to prevent the willful actions was defeated. After the PS decided to work outside the scope of TIP 5, the supervisory oversight assisted in the unauthorized operation. Process knowledge failed the PS, PM, and PF when a solution of a higher than expected Pu concentration was obtained. The root cause analysis team does not know if foreknowledge of the plutonium concentration in the actual solution drained would have prevented the unauthorized operation by the PS."

#### DIRECT CAUSE OF THE OCCURRENCE:

The direct cause of this occurrence was attributed to Personnel Error, Procedural Violation. During the performance of TIP 771-OPS-94-005 on September 29, 1994, personnel exceeded the scope of the TIP by the unauthorized draining of actinide solution from the fill and drain lines leading to Tank 467. This occurrence was reported as SPMS 1490. The LO/TO errors, the pen-and-ink changes to Appendix 7 of the TIP, and the sampling activities which violated the Building 771 OSR, as reported under SPMS 1505, SPMS 1554, and SPMS 1600, were also considered to be personnel errors. As a corrective action, disciplinary actions were instituted for the personnel involved in the incident. These disciplinary actions will not be documented in this report.

Because the extensive corrective actions outlined in the PA investigatory team report do not tie exclusively to any specific cause, the corrective actions will not be listed in this section.

#### **24. Evaluation (by Facility Manager/Designee):**

Multiple investigations and evaluations are being performed on the four incidents detailed in Section 15. These investigations may result in further information being gathered which will be detailed in the final report.

Because the ON&R Occurrence Reporting personnel were not part of the PA team involved in investigating and reporting on this occurrence, the conclusions quoted in this occurrence report are as reported by that team. Occurrence Reporting personnel were unable to verify any information in the PA team report.

#### **25. Is Further Evaluation Required?: No**

#### **26. Corrective Actions** (\* = Date added/revised since final report was approved.)

1. Capture Lessons Learned in Tank Draining Plan of Action. This is to be kept on file for use in future Action Plans.

G. E. Francis Waste Stabilization

**Target Completion Date:** 02/28/1995 **Completion Date:** 02/28/1995

2. Initiate training program for lower level managers within the existing training plan for supervisors in the protected area.

R. A. Amey Organizational Effectiveness

**Target Completion Date:** 02/28/1995 **Completion Date:** 02/28/1995

3. Conduct workshop in Building 771 on Methods to Improve Working Conditions.

J. D. Weaver Waste Stabilization

**Target Completion Date:** 12/31/1994 **Completion Date:** 12/31/1994

4. Complete agreed upon actions determined in the "Methods to Improve Working Conditions" workshop.

S. M. Sax Building 771 Operations Manager

**Target Completion Date:** 06/30/1995 **Completion Date:** 03/30/1995

5. Initiate monthly review of Waste Stabilization Status following the third Weekly Staff Meeting of each month.

R. E. Fray Director, Waste Stabilization

**Target Completion Date:** 02/28/1995 **Completion Date:** 02/28/1995

6. Conduct review of incident with all Building 771 personnel.  
R. E. Fray Director, Waste Stabilization  
**Target Completion Date:** 03/31/1995 **Completion Date:** 03/31/1995
7. Conduct a standdown in Building 771, using one activity to address adequacy of Status Board. This action taken in order to improve processes for maintaining building status in compliance with approved authorization bases.  
R. E. Fray Director, Waste Stabilization  
**Target Completion Date:** 01/20/1995 **Completion Date:** 01/20/1995
8. Implement a new Status Board in Building 771.  
S. M. Sax Building 771 Operations Manager  
**Target Completion Date:** 05/31/1995 **Completion Date:** 05/31/1995
9. Increase presence of Waste Stabilization Director in Building 771 on a routine basis.  
R. E. Fray Director, Waste Stabilization  
**Target Completion Date:** 01/31/1995 **Completion Date:** 01/31/1995
10. Prescribe Senior Management presence in Plan of Action for future activities in Building 771.  
R. E. Fray Director, Waste Stabilization  
**Target Completion Date:** 01/31/1995 **Completion Date:** 01/31/1995
11. Conduct small group seminars for Operators, Maintenance, and Radiological Control work groups in Building 771 in order to enhance training on nuclear criticality safety.  
J. L. Byrd Criticality Safety  
**Target Completion Date:** 01/31/1995 **Completion Date:** 01/31/1995
12. Institute Two-Person Rule for activities in high risk areas within Buildings 771, 774, and 886. This action is required to implement protection against knowing and intentional violation of safety requirements until other improvements are implemented.  
J. D. Weaver Waste Stabilization  
**Target Completion Date:** 01/31/1995 **Completion Date:** 01/31/1995
13. Require physical barriers, supervision, and independent oversight with Plans of Action for high risk/priority activities.  
J. D. Weaver Waste Stabilization  
**Target Completion Date:** 01/31/1995 **Completion Date:** 01/31/1995
14. To assure trained and qualified personnel are assigned to the operations, review status of Operator and Management training. Ensure all basic training has been completed.

H. Ampy, Jr. Training

**Target Completion Date:** 01/31/1995    **Completion Date:** 01/31/1995

### **27. Impact on Environment, Safety and Health:**

There was no impact to the environment or the health and safety of personnel or the public as a result of this occurrence. As quoted from the PA investigatory team report, as part of the section titled Summary of Root Cause Analysis Conclusions, "Thus, there was a safety margin even in the unauthorized operation, albeit not known or controlled in advance. Information was provided to the root cause analysis team from Engineering and Safety Services (Letter DPS-139-94) indicating that Tip 5 included adequate double contingency and double contingency was achieved during the execution of TIP 5, until the beginning of the unauthorized operation."

### **28. Programmatic Impact:**

There was no specific impact or measurable consequence to the program as a result of this occurrence.

### **29. Impact on Codes and Standards:**

There was no specific violation of national codes and standards, program standards, or other DOE orders identified in the PA investigatory team report.

### **30. Lessons Learned:**

The following evaluation is quoted from the PA investigatory report.

"Summary of Root Cause Analysis Conclusions:

The unauthorized operation did not comply with the NMSL associated with TIP 5. Also, the unauthorized operation did not comply with Conduct of Operations practices established in the procedures and training at Rocky Flats.

Although the NMSL was not complied with, there was still some safety margin to prevent an actual criticality event. The authorized scope of work resulted in fifty-five 4-liter bottles containing solutions with plutonium concentrations of less than the limit of 5 g/l. The unauthorized operation resulted in accumulation of an additional five 4-liter bottles of solution, three with a plutonium concentration in excess of the 5 g/l NMSL. In order to have a criticality, more solution at a concentration significantly higher than 5 g/l would have been required. Thus, there was a safety margin even in the unauthorized operation, albeit not known or controlled in advance. Information was provided to the root cause analysis

team from Engineering and Safety Services (Letter DPS-139-94) indicating that Tip 5 included adequate double contingency and double contingency was achieved during the execution of TIP 5, until the beginning of the unauthorized operation."

**31. Similar Occurrence Report Numbers:**

None Identified

**32. User-defined Field #1:**

**33. User-defined Field #2:**

**34. HQ Keyword(s):**

01C--Conduct of Operations - Criticality (Stop Jan 99)

**35. HQ Summary:**

**36. DOE Facility Representative Input:**

**37. DOE Program Manager Input:**

**38. Approvals:**

**Approved by:** MATHIASMEIER, SUE G, Facility Manager/Designee

**Date:** 08/07/1995

**Telephone No.:** (303) 966-6467

**Approved by:** NOYES, DELMAR L, Facility Representative/Designee

**Date:** 08/09/1995

**Telephone No.:** (303) 966-3001

**Approved by:** JUROFF, KURT T, Program Manager/Designee

**Date:** 08/18/1995

**Telephone No.:**